IN THE CLAIMS:

1. (Previously Amended) In a wavelength router for fiber optical networking and computer interconnects, the improvement comprising:

at least one diffraction grating which utilizes only N wavelengths to interconnect N inputs to N outputs in a fully non-blocking manner, wherein N is any number,

a second diffraction grating positioned to receive outputs from said first mentioned diffraction grating,

a collection optic assembly positioned to receive outputs from said second diffraction grating, and

a plurality of filter modules positioned to receive outputs from said collection optic assembly.

2. (Canceled)

3. (Canceled)

4. (Currently Amended) In a wavelength router for fiber optical networking and computer interconnects, the improvement comprising:

at least one diffraction grating operated in a Littrow configuration which utilizes only N wavelengths to interconnect N inputs to N outputs in a fully non-blocking manner, wherein N is any number, and

said at least one diffraction grating being augmented by a wavelength-selective coupler which comprises an optical wavelength add-drop multiplexer.

6. (Previously Amended) The improvement of claim 1, wherein said diffraction gratings are identical.

7. (Currently Amended) In a wavelength router for fiber optical networking and computer interconnects, the improvement comprising:

at least one diffracting grating operated in a Littrow configuration which utilizes only N wavelengths to interconnect N inputs to N outputs in a fully non-blocking manner, wherein N is any number,

a collection optic assembly positioned to receive outputs from another diffraction grating, and

a plurality of filter modules positioned to receive outputs from said collection optic assembly.

8. (Original) The improvement of Claim 7, wherein said filter modules each comprise wavelength selective add/drop filter modules.

9. (Original) The improvement of Claim 7, wherein each of said filter modules include different filters.

10. (Original) The improvement of Claim 7, wherein said plurality of filter modules comprises N-1 different filters for N inputs and N wavelengths.

11. (Currently Amended) In a wavelength router for fiber optical networking and computer interconnects, the improvement comprising:

~~at least one diffraction grating which utilizes only N wavelengths to interconnect N inputs to N outputs in a fully non-blocking manner, wherein N is any number,~~

a first diffraction grating,

a second diffraction grating positioned to receive outputs from said first mentioned diffraction grating, wherein said first and said second grating operate so as to utilize only N wavelengths to interconnect N inputs to N outputs in a fully non-blocking manner, wherein N is any number,

at least one collection and re-direction optic assembly positioned to direct inputs to said first-mentioned diffraction grating, and

a retro-reflector assembly positioned to receive outputs from said second diffraction grating so as to retro-reflect solely predetermined complimentary outputs

produced by said first and said second gratings for redirection by said at least one collection and re-direction optic assembly ~~and reflect certain of said outputs back through said diffraction grating~~.

12. (Original) The improvement of Claim 11, wherein said collection and re-direction optic assembly additionally redirects the reflected outputs back through the diffraction grating.

13. (Previously Amended) The improvement of claim 11, wherein said retroreflector assembly is constructed to vertically displace and retro-reflect N-1 beams, wherein N is any number.

14. (Original) The improvement of Claim 8, wherein said filter modules are of a 3-port type.

15. (Previously Amended) The improvement of Claim 4, additionally including at least one coupler for combining outputs from said at least one diffraction grating.

16. (Canceled)

17. (Canceled)

18. (Canceled)

19. (Canceled)

20. (Canceled)

21. (Canceled)

22. (Previously Presented) The improvement of Claim 4, additionally including a second diffraction grating position to receive outputs from said first mentioned diffraction grating.

23. (Canceled)

24. (New) The improvement of Claim 7, wherein said diffraction grating is augmented by elements selected from the group consisting of coupler and wavelength selective elements to provide fully non-blocking interconnection.

25. (New) The improvement of claim 24, wherein said coupler is selected from the group consisting of directional couplers and wavelength-selective couplers.

26. (New) The improvement of claim 25, wherein said coupler comprises a wavelength-selective coupler which comprises an optical wavelength add-drop multiplexer.